

**100. Note on the Two *Hexacoralla*, *Goniocorella dumosa* (Alcock) and *Bantamia gerthi*, gn. et sp. nov.\***

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This article is based on two species of the *Hexacoralla* of arborescent growth, one from Sagami Bay and the other from the Neogene of Java, both somewhat simulating in growth-habit the Mesozoic corals of the genera *Goniocora* or *Cladophyllia*. The recent form is indistinguishable from *Pourtalesmilium dumosa* (Alcock), from the East Indian seas, for which the present writers erected, some years ago, a new genus *Goniocorella*; the Japanese material is here described for the first time. The other fossil coral represents a new type, resembling *Galaxea*.

*Goniocorella* Yabe et Eguchi, 1932

1932. *Goniocorella*, Yabe and Eguchi: A Study of the Recent Deep-water Coral Fauna of Japan. Proc. Imp. Acad., VIII, 8, p. 389.

Genotype: *Pourtalesmilium dumosa* Alcock; recent.

"Corallum dendroid, branching perpendicularly by repeated gemmation; wall sometimes elongated to stoloniferous processes and uniting neighbouring corallites. Corallites cylindrical, narrow, almost uniformly broad throughout their length. Calice circular, deep; no columella and pali. Septa thin, distant, arranged in 3 cycles of hexameral plan, short, except for those of the first cycle, which extend almost to the center of the corallite in its basal part; interseptal loculi vacant in young corallites and traversed by distant horizontal tabulae in older ones".

To this should now be added: Septa entire along the margin, smooth on lateral faces.

In the "Report on the Deep Sea Madreporaria of the Siboga Expedition", 1902, A. Alcock described an elegant dendroid coral, *Pourtalesmilium dumesa* sp. nov., from the Siboga Stations 156 (0° 29'.2 S, 130° 5'.3 E; 469 m) and 259 (5° 29'.2 S, 132° 52'.5 E; 487 m). In the collection of corals now at the disposal of the writers, there is a fairly good specimen, shown by the accompanying figures 1-3, which is quite indistinguishable from this species.

Alcock's original description of *P. dumosa* follows:—

"The present corallum is long, straight or slightly sinuous, cylindrical and of the same diameter throughout: it gives off, on every side, buds which grow out into branches like but shorter than the parent and these again give off a few short secondary branches: the primary and secondary branches may unite to form a bush with scalariform ramifications. The whole outer surface of the corallum is covered with fine discrete granules and is traversed by fine granular costal striations.

The calicular orifice is circular and the fossa extremely deep. The fossa is but little encroached upon by the non-exsert septa, which are in six systems and three cycles, those of the first cycle being much longer than those of the second which again are little larger than those of the third. All the septa are thin, entire and sometimes microscopically granular or spicular.

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The septa of the first cycle unite at the bottom of the calice, but there is no columella.

The dissipiments are thin sheets of vitreous tissue placed very far apart.

I place this species in Martin Duncan's genus *Pourtalosmilia*, without however being able to appreciate the difference between this genus and the Triassic and Jurassic genus *Goniocora*. In external form, this species much resembles the *Caryophyllia arbuscula* figured by Dana on plate 27 of the Zoophytes."<sup>1)</sup>

*Pourtalosmilia*,<sup>2)</sup> proposed by P. M. Duncan to replace his *Blastosmilia*<sup>3)</sup>, a name preoccupied, was defined as follows:

"Colony formed by repeated gemmations from the wall of the parent corallite, and occasionally from the wall of buds. Corallites conicocylindrical, long, bent, except the straight parent, and parallel with this last. Calices circular, deep. Columella rudimentary, or as trabeculae from the septal ends. Septa entire, thin, slightly exsert; they project but slightly into the calice, except the primaries and secondaries. Costae rudimentary and only exist near the calices. Wall thin, with a granular epitheca closely attached. Dissipiments wide apart."

He added that "the parent corallite survives with the buds and does not die, as in *Anomocora* and *Coenosmilia*."

*Coenosmilia*<sup>4)</sup> is a genus established by L. F. de Pourtalès, in 1874, for a compound Parasmilae, propagating by gemmation. E. von Marenzeller<sup>5)</sup> saw no need of separating *Coenosmilia* from *Parasmilia*, while, on the other hand, lately T. W. Vaughan and J. W. Wells<sup>6)</sup> accepted both genera as valid, regarding *Anomocora* Studer, 1878,<sup>7)</sup> and *Pourtalosmilia* as mere synonyms of *Coenosmilia*, contrary to the opinion of Duncan and von Marenzeller. The present writers will follow the last mentioned procedure.

Since the genotype of *Coenosmilia*, *C. arbuscula* Pourtalès, from Barbados, 100 fathoms, forms dendroid coralla in irregular clusters, with each corallite regularly conical, and having well developed spongy columella, "*Pourtalosmilia*" *dumosa* with cylindrical corallites without columella can not be considered as being congeneric with *Coenosmilia arbuscula*; it seems to deserve rank as a distinct genus.

#### *Goniocorella dumosa* (Alcock)

Figs. 1 and 2

1902. *Pourtalosmilia dumosa* Alcock: Report on the Deep Sea Madreporaria of the Siboga Expedition, p. 36, pl. V, figs. 33, 33a.

1932. *Goniocorella dumosa* (Alcock), Yabe and Eguchi: A Study of the Recent Deep Water Coral Fauna of Japan, p. 389.

Being monotypic, the above mentioned generic description covers all the essential features exhibited by the genotype, *G. dumosa*, it being only needed to be added here as an illustration of a specimen from Japan, believed to be identical with the type examples referred to by Alcock.

The bush-shaped colony of *G. dumosa* from Japan forms irregular clusters of numerous elongate coralla of size nearly 10 × 10 × 8 cm. It consists of many more or less upright or somewhat radially growing parent coralla, which are perhaps derived by gemmation from a primary corallum. These parent coralla are long, the longest one being 70 mm. straight or slightly sinuous, cylindrical, and almost uniformly broad

except at the slightly narrower basal parts. The lateral branches, or corallites, that issue from all sides of the parent coralla are much shorter, 2.5–4 mm broad, frequently giving rise to one or more secondary branches of similar size; although all the coralla and corallites are normally free on the lateral side, they are sometimes united by an extension of walls, resulting in ramifications of the colony which are particularly complicated at the basal part.

The calices are usually circular, although sometimes more or less obliterated, entire and slightly curved in at the margin, and surrounded by a very thin wall which is smooth outside, showing only a faint trace of parallel longitudinal costae near the calicinal margin. The septa are very thin, distinct, never exsert, entire at margin, smooth on lateral faces, and arranged in 3 hexameral cycles; those of the first cycle are scarcely one-half the length of the radius of the calice, although at its basal part they extend almost to the center of the corallite, the rest of the septa belonging to other cycles, being but slightly more than traces. There are neither columella nor pali, the wide interseptal and central loculi being left quite vacant in the young corallites while they are traversed at same levels by very thin, flat, horizontal, distant (3–5 mm apart) tabulae in the older ones.

In its general growth-habit, it is similar to such Mesozoic genera as *Cladophyllia*<sup>8)</sup> and *Goniocora*<sup>9)</sup>, from Europe, and to the Neogene genus *Bantamia* from Java to be described below. In *Cladophyllia*, the cylindrical corallites are completely covered by epitheca, and provided with septa delicately denticulated along the margin and granulated laterally; dissepiments are probably developed in it as in *Thecosmilia*. In *Goniocora*, the corallites always possess rudimentary, but distinct columella; it agrees with the present form in having the wall quite naked, without epitheca. Lastly, *Bantamia* has a rudimentary pseudo-columella and vesicular dissepiments; in its mural structure and feeble development of coenenchym is also characteristic.

Localities: Okinose, off Misaki, Miura Peninsula, Kanagawa-ken Reg. Nos. 50546 (figured specimen), 60425. Off Misaki, Miura Peninsula, Kanagawa-ken; Reg. Nos. 38571, 43412, 57494. Sôyô-maru Station 255, 34° 46' 15" N, 139° 05' E (Izu Peninsula, eastern coast), 263 m; Reg. No. 58955. All the specimens are stored in the Institute of Geology and Palaeontology, Tôhoku Imperial University.

*Bantamia*, gn. nov.

Genotype: *Bantamia gerthi*, sp. nov., from the Miocene of Java.

*Bantamia gerthi*, sp. nov.

Figs. 3–5

Corallum fasciculate; corallites cylindrical, elongate, tortuous, distantly branching by gemmation; offshoots laterally free; circular to oval in cross-section; mother corallites 4.5–6 mm, and offshoots 3–3.5 mm broad; angle of divergence usually more than 45°, with branches ascending at distal portion. Wall bluntly costate only at calicular mar-

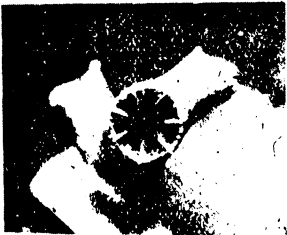
gin, thin, often secondarily thickened, then sometimes leaving a number of lacunae in a layer along the periphery. Septa thin, smooth on lateral faces, unequal in size according to difference in cycles; generally 3 hexameral cycles complete, in addition to which some rudimentary ones of the fourth cycle appear in large corallites; 12 septa of the two early cycles extending deep down to the center of the visceral cavity, where a rudimentary pseudocolumella is formed by their slightly expanded inner margins; septa of the third cycle thin and very short; septal formula in young corallites 6-6-12, septa of the different cycles differing greatly in size. Dissepiments delicate, but well developed, usually horizontal, numbering 6-7 per 3mm. Coenenchymal cysts slightly developed at branching angles.

Remarks: The corallum attains to a size of  $100 \times 80 \times 50$  mm; in general growth-habit and size of corallites, it greatly resembles *Goniocorella dumosa* (Alcock) from the deep waters of Japan and farther south, though generically different by having rudimentary pseudocolumella and dissepiments; in the latter genus, the visceral cavity is partitioned only by distant tabulae, and the vertical septa do not meet at its center.

In growth-habit, the present fossil recalls *Goniocora* from the Mesozoic, in which genus, however, the corallites are provided with rudimentary, but distinct columella better developed than in the present fossil, and are prominently costated, the costae being strongly granulated on the back.

On the other hand, in the structure and texture of the corallites, the present fossil greatly resembles *Galaxea* on one hand and also *Acrhelia* on the other. *Galaxea* always forms massive coralla, consisting of elongate, cylindro-conical corallites projecting considerably from the general surface of rich coenenchymal tissue; only in the young stage of growth is the corallum, at any rate in *G. musicalis*, more or less dendroid, being fairly similar in this respect to *Acrhelia*. In *Acrhelia*, the corallum is dendroid, each branch consisting of spirally arranged corallites which project at their distal end from the general surface of the branch; each branch which is the greatly thickened wall of a corallite, often includes the next one in its initial growth-stage. This genus, which has long been included by many authors in the family Oculinidae, with *Oculina* and its allies, has, in common with *Oculina*, the spirally arranged corallites and thickened wall, but agrees in many other respects, with *Galaxea* and the present fossil, namely, in the nature of the wall before secondary thickening, in the arrangement of septa, in lacking proper columella and pali, and further, in the possession of horizontal dissepiments instead of tabulae. The vesicular coenenchym, which is abundantly developed in *Galaxea* is almost lacking in *Acrhelia* and the present fossil, all there is being slight traces of it only at the branching angles. In *Galaxea*, deprived of coenenchymal tissue, the corallum consists of long subparallel fasciculate corallites, while in *Acrhelia*, it is dendroid, with branches composed of spirally arranged corallites, whereas in the present fossil, it is distinctly branching, each branch representing a single elongate

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corallite. Notwithstanding the considerable differences in growth-habit of corallum and corallites, the great similarity in the essential features of their corallites seems to point to the intimate affinity between them.

The specific name is dedicated to Prof. H. Gerth of Amsterdam in appreciation of his valuable contributions to geology and palaeontology, especially those of the Malay Islands.

Locality: Tyoö, Bantam, Java. Chitani collection No. 80 (collector S. Watase). One specimen examined; stored in the Institute of Geology and Palaeontology, Tôhoku Imperial University, Reg. No. 65072.

#### Explanation of Figures.

Figs. 1, 2. *Goniocorella dumosa* (Alcock) from Okinose, off Misaki, Miura Peninsula, Kanagawa-ken. 1, nat. size; 2, 3 times enlarged.

Figs. 3-5. *Bantamia gerthi*, gn. et sp. nov., Tyoö, Bantam, Java; Neogene. 3, polished surface in nat. size (*Alveopora* in association); 4, thin section in transmitted light, 3 times enlarged; 5, a part of Fig. 4 more enlarged to show an initial stage of coenenchym-building, 10 times nat. size.

#### Literature.

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- 3) P. M. Duncan: Madreporaria of the Deep Sea. Trans. Zool. Soc. London, vol. X, pt. 5, 1878, p. 244.
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- 7) T. Studer: Übersicht der Steinkorallen aus der Familie der Madreporaria aporosa Eupsammina und Turbinaria, welche auf der Reise S. M. S. "Gazelle" um die Erde gesammelt wurden. Mon.-Ber. Akad. Berlin, 1877, p. 641 (cited after T. W. Vaughan and J. W. Wells, l. c.)
- 8) M. Edwards et J. Haime: Monographie des polypiers fossiles des Terrains Palaeozoïques. Archivès du Muséum d'Histoire naturelle, V., 1851, p. 81.
- 9) M. Edwards et J. Haime: Op. cit., p. 96.